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EXAMINER

SHAKERI, HADI

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PAPER

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte TOMOHIRO KONDO, MASAHIKO IIZUMI, MASAHIRO
OMATA, KIYOSHI HASEGAWA, TAKASHI OGINO, TAKAFUMI
WATANABE, YOSHIYUKI CHIDA, YASUSHI MATSUSHITA, and
KAZUO TAKEDA

Appeal 2009-005350
Application 10/772,429
Technology Center 3700

Decided: March 10, 2010

Before WILLIAM F. PATE, III, STEFAN STAICOVICI, and
FRED A. SILVERBERG, *Administrative Patent Judges*.

STAICOVICI, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Tomohiro Kondo et al. (Appellants) appeal under 35 U.S.C. § 134 (2002) from the Examiner's decision rejecting claims 1, 3, 4, 6, 7, 9, 10, 26, and 27. Claims 2, 5, 8, 21, 22, and 25 have been canceled and claims 11-20, 23, and 24 have been withdrawn by the Examiner. We have jurisdiction over this appeal under 35 U.S.C. § 6 (2002).

THE INVENTION

Appellants' invention relates to a method and device for surface finishing a workpiece W including a workpiece support WS, a pressure applying mechanism 10 for applying a pressure force to lapping film 11, a drive mechanism 40 for driving the workpiece W, and an oscillating mechanism 50 for laterally shifting at least one of the workpiece W or the lapping film 11. Spec. 10, ll. 11-26 and fig. 1. The pressure applying mechanism 10 includes an upper shoe case 28A carrying a plurality of shoes 21A and a lower shoe case 28B carrying a plurality of shoes 21B. Spec. 12, ll. 19-22 and fig. 2. The upper and lower shoes 21A and 21B, respectively, are positioned mutually offset by an offset displacement δ such that they overlap in a central region C and do not overlap in the terminal regions D of the workpiece periphery W1. Spec. 16, ll. 6-14 and fig. 3. The offset displacement δ is smaller than the oscillating stroke provided by oscillating mechanism 50. Spec. 18, ll. 19-24.

Claim 1 is representative of the claimed invention and reads as follows:

1. A surface finishing apparatus for surface finishing a target shaped periphery of a workpiece into a mid-concave profile, comprising:

a workpiece supporting mechanism for supporting the workpiece having the target shaped periphery to be surface finished;

a surface finish tool including a lapping film adapted to be in abutting contact with the target shaped periphery of the workpiece;

a pressure applying mechanism including a plurality of shoes disposed on a rear side of the lapping film to be operative to apply a pressure force to the lapping film to cause the lapping film to be held in pressured contact with the target shaped periphery of the workpiece;

a drive mechanism for rotating the workpiece about an axial direction during operation of the pressure applying mechanism to allow the surface finish tool to surface finish the target shaped periphery of the workpiece into the mid-concave profile, while exhibiting a distribution pattern of the pressure force of the surface finish tool; and

an oscillating mechanism for oscillating at least one of the workpiece and the lapping film in the axial direction of the workpiece in a given oscillation stroke such that a working position of the lapping film is cyclically shifted in the given oscillation stroke with respect to the target shaped periphery of the workpiece to allow the workpiece to be surface finished in the mid-concave profile,

wherein the pressure applying mechanism is adapted to operatively hold the plurality of shoes on the rear side of the lapping film in different contact areas in a partially overlapping relationship at a central region of the target shaped periphery of the workpiece and in non-overlapping relationship

in both terminal regions of the target shaped periphery such that the plurality of shoes are held in opposing offset positions with offset displacement of each of the plurality of shoes set to be less than the given oscillation stroke provided by the oscillating mechanism to allow the central region of the target shaped periphery to be lapped at a greater rate than those at which other regions of the target shaped periphery are lapped, resulting in the target shaped periphery having a surface profile formed in the mid-concave profile having a depth equal to or greater than 5 μm and equal to or less than 20 μm .

THE REJECTIONS

The Examiner relies upon the following as evidence of unpatentability:

Judge	US 4,682,444	Jul. 28, 1987
Hirayama (translation) ¹	JP 10-217090	Aug. 18, 1998

Appellants seek review of the Examiner's rejection of claims 1, 3, 4, 6, 7, 9, 10, 26, and 27 under 35 U.S.C. § 103(a) as unpatentable over Judge and Hirayama.²

¹ Both Appellants and the Examiner refer to Hirayama as "JP '090." *See, e.g.*, Ans. 4 and App. Br. 13.

² On Page 3 of the Examiner's Answer, in the heading of this rejection, the Examiner states that claims 1-3, 9, 10, 26 and 27 are rejected under 35 U.S.C. § 103(a) as unpatentable over the combined teachings of Judge and Hirayama. However, claim 2 was canceled in Appellants' Amendment filed May 25, 2006. In addition, the Examiner has omitted claims 4, 6, and 7 from the heading, although they are under final rejection. *See* Final Rejection, mailed Dec. 7, 2007, at 2. For the purpose of this appeal, we shall consider the insertion of claim 2 and the omission of claims 4, 6, and 7 as

OPINION

Appellants argue that:

Neither Judge nor JP '090 teach or suggest the feature of shoes held as recited. Specifically, the shoes of JP '090 are not held in opposing offset positions such that their respective *offset displacements are set to be less than the given oscillating stroke provided by the oscillating mechanism.*

App. Br. 20.

In response, the Examiner takes the position that:

[T]he pressure applying mechanism [of Judge] is modified in view of JP'090 or "adapted to" operatively hold the shoes on the rear side of the lapping film in different contact areas in a partially overlapping relationship in a center region (e.g., Fig. 2, JP'090) of the target shaped periphery of the workpiece with an offset displacement of each of the plurality of shoes set to be less than the given oscillating stroke, i.e., setting the parameters of the apparatus, e.g., offset less than the oscillation is considered by the examiner to be obvious to one of ordinary skill in the art is optimizing the operation based on intended results, as such modification would only require routine experimentations which yield predictable results.

Ans. 5.

At the outset, we agree with the Examiner that Judge discloses all the features of independent claims 1, 26, and 27 with the exception of partially overlapping shoes at the central region and non-overlapping shoes at the terminal regions of the surface of a workpiece. Ans. 3. We further agree

typographical errors. The correct numbering of the claims on appeal is shown above.

with the Examiner that Hirayama shows such an arrangement of shoes in a paper lapping device. Ans. 4. *See also*, Hirayama, para. (0013) and fig. 2. However, like Appellants, we find that neither Judge nor Hirayama discloses any *relationship* between the oscillation stroke provided by the oscillating mechanism of Judge and the offset displacement of the shoes of Hirayama. Although we appreciate the Examiner's position that Judge discloses the "importance of the rate of lateral oscillation of [the] upper and lower shoes" (Ans. 6-7), nonetheless, the combined teachings of Judge and Hirayama do not disclose a *relationship* between the oscillation stroke provided by the oscillating mechanism of Judge and the offset displacement. At most, we find that Judge discloses only the importance of the oscillation rate in producing a desired machining action. *See* Judge, col. 6, ll. 10-14. We could not find any teaching in either Judge or Hirayama that would have led a person of ordinary skill in the art to a relationship between the oscillation stroke and the offset displacement of the shoes, moreover, to a specific relationship where the offset displacement is "*set to be less* than the given oscillation stroke" of the oscillating mechanism, as called for by each of claims 1, 26, and 27. Emphasis added. Although we appreciate the Examiner's position that setting the offset displacement of the shoes to be less than the oscillation stroke would require a person of ordinary skill in the art to use mere routine experimentation; nonetheless, that same person of ordinary skill in the art would have had to first recognize the benefits of a relationship between the offset displacement of the shoes and the oscillation stroke of the oscillating mechanism before using routine experimentation to set an optimum value. Hence, we do not find that the Examiner has shown that the combined teachings of Judge and Hirayama disclose a relationship

between the oscillation stroke and the offset displacement of the shoes, and moreover, a specific relationship where the offset displacement is “set to be less than the given oscillation stroke” of the oscillating mechanism, as called for by each of claims 1, 26, and 27.

In conclusion, we agree with Appellants that the combined teachings of Judge and Hirayama do not disclose all the limitations of independent claims 1, 26, and 27. Therefore, the Examiner’s conclusion of obviousness based on the teachings of Judge and Hirayama is flawed. Accordingly, the rejection of independent claims 1, 26, and 27 or dependent claims 3, 4, 6, 7, 9, and 10 cannot be sustained. *See In re Fine*, 837 F.2d 1071, 1076 (Fed. Cir. 1988) (If an independent claim is nonobvious under 35 U.S.C. § 103, then any claim dependent therefrom is nonobvious).

DECISION

The Examiner’s decision to reject claims 1, 3, 4, 6, 7, 9, 10, 26, and 27 is reversed.

REVERSED

Klh

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